

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Original): An immunogenic composition comprising a polypeptide comprising an amino acid sequence which has at least 85% identity to an amino acid sequence selected from the group consisting of SEQ Group 2, over the entire length of said sequence from SEQ Group 2, or an immunogenic fragment thereof, and a pharmaceutically acceptable excipient.
2. (Original): The immunogenic composition as claimed in claim 1 in which the polypeptide comprises an amino acid sequence which has at least 95% identity to an amino acid sequence selected from the group consisting of SEQ Group 2, over the entire length of said sequence from SEQ Group 2, or an immunogenic fragment thereof.
3. (Original): The immunogenic composition as claimed in claim 1 in which the polypeptide comprises an amino acid sequence selected from the group consisting of SEQ Group 2, or an immunogenic fragment thereof.
4. (Currently amended): The immunogenic composition of claim 1 ~~claims 1-3~~ in which the polypeptide comprises an amino acid sequence which is an immunogenic fragment of the polypeptide of SEQ Group 2 in which said immunogenic fragment is capable of raising an immune response which recognises the corresponding polypeptide of SEQ Group 2.
5. (Currently amended): The immunogenic composition as claimed in claim 1 ~~any of claims 1 to 4~~ wherein said polypeptide is part of a larger fusion protein.
6. (Original): An immunogenic composition comprising a polynucleotide comprising a nucleotide sequence having at least 85% identity to the nucleotide sequence of SEQ Group 1, over the entire length of said sequence from SEQ Group 1 and a pharmaceutically acceptable excipient.
7. (Original): The immunogenic composition of claim 6 wherein the polynucleotide comprises a nucleotide sequence having at least 95% identity to the nucleotide sequence of SEQ Group 1, over the entire length of said sequence from SEQ Group 1.

8. (Currently amended): The immunogenic composition of claim 6 ~~or 7~~ wherein the polynucleotide comprises a nucleotide sequence having the sequence of any polynucleotide selected from the group consisting of SEQ Group 1.

9. (Original): An immunogenic composition comprising a polynucleotide encoding a polypeptide comprising an amino acid sequence which has at least 85% identity to an amino acid sequence selected from the group consisting of SEQ Group 2, over the entire length of said sequence from SEQ Group 2, or an immunogenic fragment thereof, and a pharmaceutically acceptable excipient.

10. (Original): The immunogenic composition of claim 9 wherein the polynucleotide encodes a polypeptide comprising an amino acid sequence selected from the group consisting of SEQ Group 2, or an immunogenic fragment thereof.

11. (Original): An immunogenic composition comprising at least or exactly two, three, four, five, six, seven, eight, nine or ten different *Bordetella*, preferably *B. pertussis*, antigens wherein the antigens are selected from at least two, three, four or five groups of proteins selected from the following:

- a) at least one *Bordetella* autotransporter protein selected from the group consisting of a polypeptide sharing at least 70% identity with SEQ ID 34, 30, 32, 36, 38, 40, 42, 44, 46, 48, 50, 52, or 54 and BipA and pertactin or an antigenic fragment thereof, preferably the passenger domain thereof;
 - b) at least one *Bordetella* iron acquisition protein selected from the group consisting of a polypeptide sharing at least 70% identity with SEQ ID 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, or 28, or an antigenic fragment thereof;
 - c) at least one *Bordetella* lipoprotein selected from the group consisting of a polypeptide sharing at least 70% identity with SEQ ID 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, or 98 or an antigenic fragment thereof;
 - d) at least one *Bordetella* adhesin selected from the group consisting of FHA, fimbriae 2 and/or 3, pertactin and BrkA or an antigenic fragment thereof; and
 - e) at least one *Bordetella* toxin/invasin or antigens involved in toxin/invasin secretion selected from the group consisting of pertussis toxin, adenylate cyclase, dermonecrotic toxin (Dnt), Type III ss or lipopolysaccharide or an antigenic fragment thereof,
- wherein the *Bordetella* antigens in the immunogenic composition do not consist of any combination of 2, 3, 4 or all 5 of pertactin, fimbriae 2, fimbriae 3, FHA and pertussis toxin.

12. (Original): The immunogenic composition of claim 11 comprising one or more Bordetella iron acquisition protein selected from the group consisting of the polypeptides sharing at least 70% identity with SEQ ID 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26 or 28, or an antigenic fragment thereof.

13. (Original): The immunogenic composition of claim 12 wherein the Bordetella iron acquisition protein is BhuR or an antigenic fragment thereof.

14. (Currently amended): The immunogenic composition of claim 11 ~~claim 11-13~~ comprising a Bordetella autotransporter protein selected from the group consisting of a polypeptide sharing at least 70% identity with SEQ ID 34, 30, 32, 36, 38, 40, 42, 44, 46, 48, 50, 52, or 54 and pertactin and BipA or an antigenic fragment, preferably the passenger domain, thereof.

15. (Original): The immunogenic composition of claim 14 wherein the Bordetella autotransporter protein is BipA, or an antigenic fragment, preferably the passenger domain thereof.

16. (Currently amended): The immunogenic composition of claim 14 ~~or 15~~ wherein the Bordetella autotransporter protein is pertactin, or an antigenic fragment, preferably the passenger domain thereof.

17. (Currently amended): The immunogenic composition of claim 14~~[[16]]~~ wherein the Bordetella autotransporter protein is BrkA, or an antigenic fragment, preferably the passenger domain thereof.

18. (Currently amended): The immunogenic composition of claim 14~~[[17]]~~ wherein the Bordetella autotransporter protein is TcfA, or an antigenic fragment, preferably the passenger domain thereof.

19. (Currently amended): The immunogenic composition of claim 14~~[[18]]~~ wherein the Bordetella autotransporter protein is BapA, or an antigenic fragment, preferably the passenger domain thereof.

20. (Currently amended): The immunogenic composition of claim 14~~[[19]]~~ wherein the Bordetella autotransporter protein is BapB, or an antigenic fragment, preferably the passenger domain thereof.

21. (Currently amended): The immunogenic composition of claim 14~~[[20]]~~ wherein the Bordetella autotransporter protein is BapC, or an antigenic fragment, preferably the passenger domain thereof.

22. (Currently amended): The immunogenic composition of claim 14~~[[21]]~~ wherein the Bordetella autotransporter protein is YapE, or an antigenic fragment, preferably the passenger domain thereof.

23. (Currently amended): The immunogenic composition of claim 11 ~~claims 11-22~~ comprising a Bordetella lipoprotein selected from the group consisting of BipA, the polypeptide sharing at least 70% identity with SEQ ID 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96 or 98 or an antigenic fragment thereof.

24. (Original): The immunogenic composition of claim 23 wherein the Bordetella lipoprotein is MltA or an antigenic fragment thereof.

25. (Currently amended): The immunogenic composition of claim 23~~[[24]]~~ wherein the Bordetella lipoprotein is MltB or an antigenic fragment thereof.

26. (Currently amended): The immunogenic composition of claim 23~~[[25]]~~ wherein the Bordetella lipoprotein is VacJ or an antigenic fragment thereof.

27. (Currently amended): The immunogenic composition of claim 23~~[[26]]~~ wherein the Bordetella lipoprotein is OmlA or an antigenic fragment thereof.

28. (Currently amended): The immunogenic composition of claim 23~~[[27]]~~ wherein the Bordetella lipoprotein is Pcp or an antigenic fragment thereof.

29. (Currently amended): The immunogenic composition of claim 11 ~~claims 11-28~~ comprising a Bordetella adhesin selected from the group consisting of BrkA, FHA, fimbriae and pertactin or an antigenic fragment thereof.

30. (Original): The immunogenic composition of claim 29 wherein the Bordetella adhesin is FHA or an antigenic fragment thereof.

31. (Currently amended): The immunogenic composition of claim 29~~[[30]]~~ wherein the Bordetella adhesin is Fimbriae 2 and/or 3 or an antigenic fragment thereof.

32. (Currently amended): The immunogenic composition of claim 11 ~~claims 11-31~~ comprising a Bordetella toxin/invasin or antigens involved in toxin/invasin secretion selected from the group consisting of pertussis toxin, adenylate cyclase, dermonecrotic toxin (Dnt), Type III ss or lipopolysaccharide (LPS) or an antigenic fragment thereof.

33. (Original): The immunogenic composition of claim 32 wherein the Bordetella toxin/invasin or antigen involved in toxin/invasin secretion is pertussis toxin or an antigenic fragment thereof.

34. (Currently amended): The immunogenic composition of claim 32~~[[33]]~~ wherein the Bordetella toxin/invasin or antigen involved in toxin/invasin secretion is Type III ss or an antigenic fragment thereof.

35. (Currently amended): The immunogenic composition of claim 32~~[[34]]~~ wherein the Bordetella toxin/invasin or antigen involved in toxin/invasin secretion is LPS or an antigenic fragment thereof.

36. (Currently amended): The immunogenic composition of claim 11~~[[35]]~~ comprising a) FHA, b) pertussis toxin and c) BrkA or a protein sharing at least 70% identity with SEQ ID 34, or an antigenic fragment thereof, preferably further comprising d) pertactin.

37. (Currently amended): The immunogenic composition of claim 11~~[[36]]~~ comprising a) FHA, b) pertussis toxin and c) BhuR or a protein sharing at least 70% identity with SEQ ID 20, or an antigenic fragment thereof, preferably further comprising d) pertactin.

38. (Currently amended): The immunogenic composition of claim 11~~[[37]]~~ comprising a) FHA, b) pertussis toxin and c) BapA or a protein sharing at least 70% identity with SEQ ID 40, or an antigenic fragment thereof, preferably further comprising d) pertactin.

39. (Currently amended): The immunogenic composition of claim 11~~[[38]]~~ comprising a) FHA, b) pertussis toxin and c) BapB or a protein sharing at least 70% identity with SEQ ID 42, or an antigenic fragment thereof, preferably further comprising d) pertactin.

40. (Currently amended): The immunogenic composition of claim 11~~[[39]]~~ comprising a) FHA, b) pertussis toxin and c) BapC or a protein sharing at least 70% identity with SEQ ID 44, or an antigenic fragment thereof, preferably further comprising d) pertactin.

41. (Currently amended): The immunogenic composition of claim 11~~[[40]]~~ comprising a) FHA, b) pertussis toxin and c) YapE or a protein sharing at least 70% identity with SEQ ID 52, or an antigenic fragment thereof, preferably further comprising d) pertactin.

42. (Currently amended): The immunogenic composition of claim 11~~[[41]]~~ comprising a) FHA, b) pertussis toxin and c) VacJ or a protein sharing at least 70% identity with SEQ ID 82, or an antigenic fragment thereof, preferably further comprising d) pertactin.

43. (Currently amended): The immunogenic composition of claim 11~~[[42]]~~ comprising a) FHA, b) pertussis toxin and c) OmlA or a protein sharing at least 70% identity with SEQ ID 92, or an antigenic fragment thereof, preferably further comprising d) pertactin.

44. (Currently amended): The immunogenic composition of claim 11~~[[43]]~~ comprising a) FHA, b) pertussis toxin and c) Pcp or a protein sharing at least 70% identity with SEQ ID 96, or an antigenic fragment thereof, preferably further comprising d) pertactin.

45. (Currently amended): The immunogenic composition of claim 11~~[[44]]~~ comprising a) FHA, b) pertussis toxin and c) MltA or a protein sharing at least 70% identity with SEQ ID 70, or an antigenic fragment thereof, preferably further comprising d) pertactin.

46. (Currently amended): The immunogenic composition of claim 11~~[[46]]~~ comprising a) FHA, b) pertussis toxin and c) MltB or a protein sharing at least 70% identity with SEQ ID 72, or an antigenic fragment thereof, preferably further comprising d) pertactin.

47. (Currently amended): The immunogenic composition of claim 11~~[[46]]~~ comprising a) FHA, b) pertussis toxin and c) TcfA or a protein sharing at least 70% identity with SEQ ID 36, or an antigenic fragment thereof, preferably further comprising d) pertactin.

48. (Currently amended): The immunogenic composition of claim 11 ~~[[47]]~~ comprising a) FHA, b) pertussis toxin and c) adenylate cyclase, or an antigenic fragment thereof, preferably further comprising d) pertactin.

49. (Currently amended): The immunogenic composition of claim 11 ~~[[48]]~~ comprising a) FHA, b) pertussis toxin and c) Type III ss or an antigenic fragment thereof, preferably further comprising d) pertactin.

50. (Currently amended): The immunogenic composition of claim 11 ~~claims 1-49]]~~ for the prevention or treatment of *Bordetella pertussis* infection.

51. (Currently amended): The immunogenic composition of claim 11 ~~claims 1-50~~ for the prevention or treatment of *Bordetella parapertussis* infection.

52. (Currently amended): The immunogenic composition of claim 11 ~~claims 1-51~~ for the prevention or treatment of *Bordetella bronchiseptica* infection.

53. (Currently amended): The immunogenic composition of claim 11 ~~claims 1-52~~ comprising a polypeptide that is expressed during the Bvg⁺ early phase of *Bordetella* infection.

54. (Currently amended): The immunogenic composition of claim 11 ~~claims 1-53~~ comprising a polypeptide that is expressed during the Bvg⁺ late phase of *Bordetella* infection.

55. (Currently amended): The immunogenic composition of claim 11 ~~claims 1-54~~ comprising a polypeptide that is expressed during the Bvgⁱ phase of *Bordetella* infection.

56. (Currently amended): The immunogenic composition of claim 11 ~~claims 1-55~~ comprising an antigen that is expressed during the Bvg⁻ phase of *Bordetella* infection.

57. (Currently amended): The immunogenic composition of claim 11 ~~claims 1-56~~, further comprising diphtheria toxoid and tetanus toxoid.

58. (Currently amended): The immunogenic composition of claim 11 ~~{{1-57}}~~ further comprising PRP capsular oligosaccharide or polysaccharide from *Haemophilus influenzae* b, preferably conjugated to a source of T-cell epitopes.

59. (Currently amended): The immunogenic composition of claim 11 ~~{{1-58}}~~ further comprising hepatitis B surface antigen (HbsAg).

60. (Currently amended): The immunogenic composition of claim 11 ~~{{1-59}}~~ further comprising inactivated polio vaccine (IPV).

61. (Currently amended): The immunogenic composition of claim 11 ~~{{1-60}}~~ further comprising one or more of Men A, C, W or Y capsular polysaccharides or oligosaccharides, preferably conjugated to a source of T-cell epitopes.

62. (Currently amended): The immunogenic composition of claim 11 ~~claims 1-61~~ further comprising a protein from *N. meningitidis* serogroup B.

63. (Currently amended): The immunogenic composition of claim 11 ~~{{1-62}}~~ further comprising one or more capsular polysaccharides or oligosaccharides from *S. pneumoniae*, preferably conjugated to a source of T-cell epitopes.

64. (Currently amended): The immunogenic composition of claim 11 ~~{{1-63}}~~ further comprising killed attenuated Hepatitis A virus.

65. (Currently amended): A vaccine comprising the immunogenic composition of claim 11 ~~{{1-64}}~~.

66. (Original): The vaccine of claim 65 comprising an adjuvant.

67. (Cancelled).

68. (Cancelled).

69. (Currently amended): A method for treating or preventing *Bordetella* infection comprising administering the vaccine of claim ~~65~~ or 66 to a host.

70. (Original): The method of claim 69 in which both *B. pertussis* and *B. parapertussis* infection is treated or prevented.

71. (Cancelled).